

What is claimed is:

1. A device for aspirating and dispensing liquid samples comprising
a pump that comprises a cylindrical chamber, a piston movable
5 in this cylindrical chamber and a piston drive that engages the
piston, the device further comprising a pulse generator that ef-
fects dispensing of samples from a liquid by generating pressure
waves in this liquid, and a tip connected to the cylindrical cham-
ber with a line, wherein the piston drive comprises a first drive
10 and a second drive used as the pulse generator, and wherein the
device also comprises a channel for flushing or rinsing the cylin-
drical chamber, and the channel discharges into the cylindrical
chamber.
- 15 2. The device according to Claim 1, wherein the cylindrical chamber,
piston, line, and tip define a space therebetween that is filled
with an essentially coherent liquid column in the presence or ab-
sence of an air gap, and the volume of a liquid sample dispensed
is determined solely by the parameters of one single pulse gen-
20 erated by the pulse generator.
3. The device according to Claim 1, wherein the first drive com-
prises a first plate movable with a spindle connected thereto and
the second drive comprises a second plate connected with the
25 first plate by the pulse generator and engages the piston.
4. The device according to Claim 2, wherein the first drive com-
prises a first plate movable with a spindle connected thereto and
the second drive comprises a second plate connected with the
30 first plate by the pulse generator and engages the piston.
5. A device according to claim 1, 2, 3 or 4, wherein the cylindrical
chamber has a volume of between 5 and 200 μ l.

6. A device according to claim 1, 2, 3 or 4, wherein the pulse generator comprises a reloaded stack of piezoelectric elements.
- 5 7. A device according to claim 1, 2, 3 or 4, wherein the tip is a disposable tip or needle for pipetting liquids.
8. A system for aspirating and dispensing liquid samples, comprising a plurality of devices according to claims 1, 2, 3 or 4.
- 10 9. A system for aspirating and dispensing liquid samples, comprising a plurality of devices according to claim 5.
10. A system for aspirating and dispensing liquid samples, comprising a plurality of devices according to claim 6.
- 15 11. A system for aspirating and dispensing liquid samples, comprising a plurality of devices according to claim 7.
- 20 12. A system according to claim 8 comprising n pumps, n line, and n tips, a first drive and a second drive having m pulse generators, wherein n is a whole number selected from 8, 96, or 384 and m is a whole number selected from 1, 2, or 3.
- 25 13. A system according to claims 9, 10, 11 or 12 comprising n pumps, n line, and n tips, a first drive and a second drive having m pulse generators, wherein n is a whole number selected from 8, 96, or 384 and m is a whole number selected from 1, 2, or 3.
- 30 14. A system according to Claim 12, comprising an array of pumps and tips arranged in parallel to one another, wherein the array corresponds in layout and format of a microplate having 96, 384, 864, 1536, or more wells.

15. A system according to Claim 13, comprising an array of pumps and tips arranged in parallel to one another, wherein the array corresponds in layout and format of a microplate having 96, 384, 864, 1536, or more wells.
16. A system according to Claim 8, comprising an array of 96, 384, or more pumps, lines, and tips, arranged in parallel to one another, a first drive, comprising at least three spindles acting on a joint first plate, and a second drive, comprising at least three pulse generators, each having a preloaded stack of piezoelectric elements, with the second drive additionally comprising a second plate connected to the first plate via the three pulse generators and that engages all three pistons simultaneously.
17. A system according claim 9, 10 or 11, comprising an array of 96, 384, or more pumps, lines, and tips, arranged in parallel to one another, a first drive, comprising at least three spindles acting on a joint first plate, and a second drive, comprising at least three pulse generators, each having a preloaded stack of piezoelectric elements, with the second drive additionally comprising a second plate that is connected to the first plate by the three pulse generators and that engage all three pistons simultaneously.
18. A system according to Claim 14, comprising an array of 96, 384, or more pumps, lines, and tips, arranged in parallel to one another, a first drive, comprising at least three spindles acting on a joint first plate, and a second drive, comprising at least three pulse generators, each having a preloaded stack of piezoelectric elements, with the second drive additionally comprising a second plate that is connected to the first plate by the three pulse generators and that engage all three pistons simultaneously.

19. A system according to one of the Claims 16 or 18 comprising a channel system that discharges into each of the cylindrical chambers.
- 5 20. A system according to Claim 17, comprising a channel system that discharges into each of the cylindrical chambers.
21. A system according to Claim 8, wherein the tips are tip plates (16, 16') that can be removed or automatically picked up and discarded.
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22. A system according to claim 12, wherein the tips are tip plates (16, 16') that can be removed or automatically picked up and discarded.
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23. A system according to claim 13 or 14, wherein the tips are tip plates (16, 16') that can be removed or automatically picked up and discarded.
- 20 24. A system according to Claim 8, further comprising a computer for controlling the aspiration and dispensing of liquid samples.
- 25 25. A system according to Claim 9, 10 or 11, further comprising a computer for controlling the aspiration and dispensing of liquid samples.
26. A system according to Claim 12, further comprising a computer for controlling the aspiration and dispensing of liquid samples.
- 30 27. A system according to Claims 13 or 14, further comprising a computer for controlling the aspiration and dispensing of liquid samples.

28. A system according to Claim 21, further comprising a computer for controlling the aspiration and dispensing of liquid samples.

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